Otex Olive Oil Ear Drops Improve Microsuction Removal of Impacted Earwax

Dr Milan D. Antonijevic and Dr Shaimaa Moustafa
School of Chemistry & Chemical Engineering
University of Surrey, UK

Introduction

Cerumen plays an important physiological role in protecting the external auditory canal from debris, microorganisms, and other foreign material. Earwax is naturally expelled from the inside of the ear toward the entrance of the ear canal, assisted by jaw movement. When this mechanism fails, excessive earwax can build up in the ear canal, become impacted, and effectively plug the ear canal. This may result in discomfort, conductive hearing impairment, or, in some cases, secondary infection.

First-line treatment for cerumen impaction consists of using cerumenolytic ear drops to soften the wax, typically applied 2 to 3 times daily for 3 to 5 days. If drops fail, ear irrigation or manual removal (microsuction) by a professional is recommended as the next step. Limited information exists on the efficacy of using ear drops prior to microsuction.

Aim

The aim of the study is to assess the ease of wax removal by microsuction following treatment with Otex Olive Oil Ear Drops using an ear model mimicking real-life conditions, in comparison with an untreated wax control.

Materials and Methods

Synthetic earwax, which closely mimics the composition of natural earwax, was prepared using a Speight-type formulation detailed in Table 1.

Table 1. Composition of artificial earwax

Ingredients	% w/w
Lanolin	21.125
Palmitic acid	18.500
Myristic acid	18.500
Linoleic acid	9.250
Oleic acid	9.250
Squalene	9.250
Liquid paraffin	4.625
Deionised water	7.500

A transparent plastic ear model, which is an equivalent anatomical copy of a human ear, was used in this study. Correct positioning of the wax was achieved by inserting a foam filler material into the ear canal, with a layer of parafilm placed over the filler. This served as a structural support for the synthetic wax, ensuring consistent and reproducible placement (Figure 1). The parafilm functioned as a barrier layer to reduce absorption of oil and softened wax into the foam substrate.

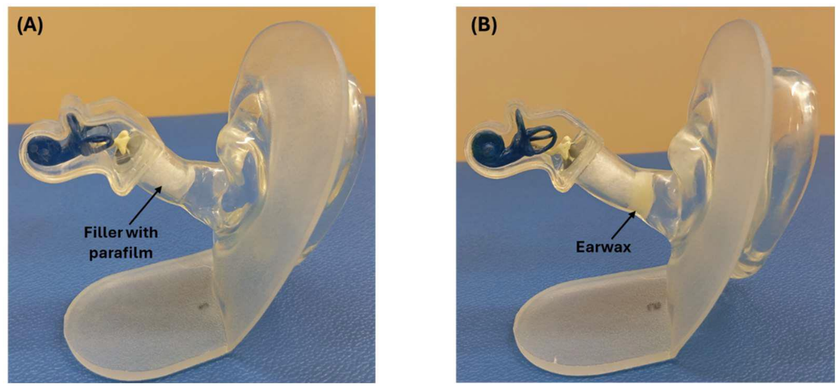

Figure 1. Artificial ear model setup. (A) without earwax and (B) with earwax

The ear model was then weighed, tilted and five drops of the synthetic wax were carefully positioned within the outer third of the canal, to form a compacted wax mass. The wax was allowed to cool and solidify at room temperature for 24 h and the model was then reweighed. The ear model was then tilted, and 3 drops of Otex Olive Oil Ear Drops were applied to the wax. The drops were left in contact with the wax for 30 minutes at 37 °C. Microsuction was then performed for 60 seconds using the Ear Wax Vacuum removal instrument at the highest speed setting. The ear model was then reweighed to determine the amount of wax removed by microsuction.

An identical procedure was performed without the application of Otex Ear Drops to serve as an untreated control. Nine replicates were performed for each of the treated and untreated models and the percentage of the earwax removed via microsuction was then calculated.

Results

The untreated wax was hardened, compact, and adherent to the artificial ear canal wall, resulting in noticeable resistance to removal during microsuction. Consequently, complete removal was not achieved, and substantial residues remained on the canal surface.

In contrast, application of Otex Olive Oil Ear Drops markedly improved the microsuction process. Treatment resulted in softening of the wax, reducing adhesion to the canal surface and facilitating removal by microsuction. A mean removal of 93% (n = 9) was observed for the treatment with Otex Olive Oil Ear Drops followed by microsuction, compared to a mean removal of 57% (n = 9) observed for microsuction alone (Figure 2).

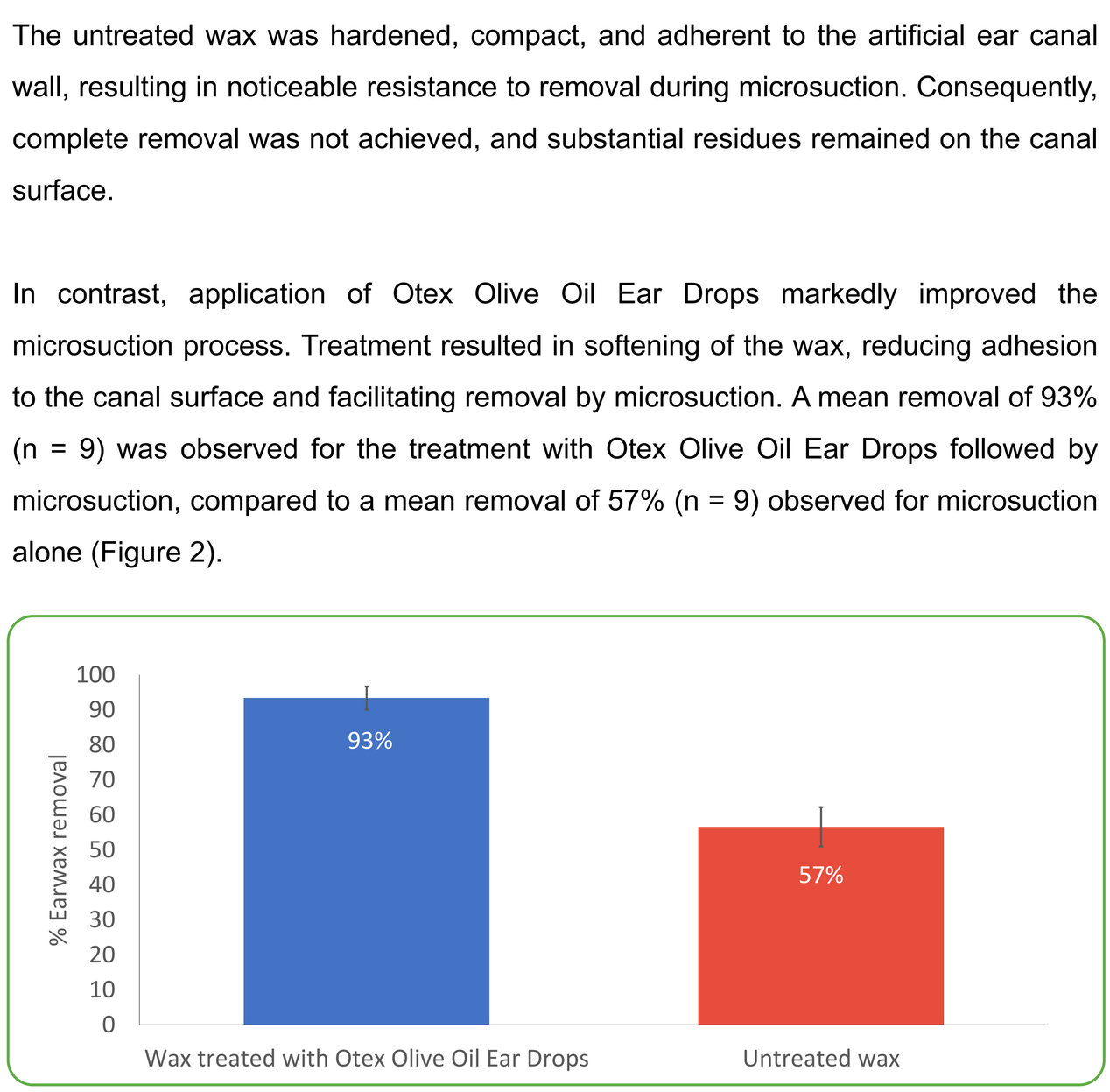

Figure 2. Percentage of earwax removal (± SD) for the treated and untreated models (n=9)

Conclusion

The study provides quantitative evidence that Otex Olive Oil Ear Drops can lubricate, soften and loosen hardened wax, facilitating more efficient and effective removal of impacted cerumen by microsuction. Near complete clearance was observed with Otex Olive Oil Ear Drops in combination with microsuction, compared to microsuction alone.